CLAIMS

1. A scaffold material comprising sintered glass or ceramic fibers and wherein the scaffold material is porous.

2. The scaffold of claim 1, wherein glass fibers comprise bioactive glass fibers.

3. The scaffold of claim 1 or 2, wherein the glass fibers are sintered together at a temperature from between about 300°C to about 1500 °C.

4. The scaffold of claim 1 or 2, wherein the glass fibers are sintered together at a temperature from between about 600°C to about 700 °C.

5. The scaffold of claim 1 or 2, wherein the glass fibers are sintered together at a temperature from between about 630°C to about 680 °C.

6. A scaffold comprising sintered glass fibers having a coating of one or more biocompatible polymers or copolymers.

7. The scaffold of claim 6, wherein the glass fibers comprise bioactive glass fibers.

8. The scaffold of claim 6 or 7, wherein the biocompatible polymer is selected from the group consisting of polyglycolide, polylactide, poly-β-hydroxybutyric acid, polydioxanone, polyvinylalcohol, polyesteramine, their copolymers and polymer blends thereof.

9. The scaffold of claim 6, wherein the coating has a thickness of about 1 μm to about 200 μm.

10. The scaffold of claim 6, wherein the coating has a thickness of from about 5 μm to about 30 μm.

11. The scaffold of claim 6, wherein glass the fibers coated with a polymer are sintered at a temperature of between about 50 to about 300 °C.

12. The scaffold of claim 6 wherein the glass fibers coated with a polymer are sintered at a temperature of between about 100 °C to about 200 °C.

13. The scaffold of claim 1 or 6, wherein the glass fibers comprise bioactive glass having a composition of about 53 - about 60 wt-% SiO_2, about 0 - about 34 wt-% Na_2O, about 1 - about 20 wt-% K_2O, about 0 - about 5 wt-% MgO, about 5 - about 25 wt-% CaO, about 0 - about 4 wt-% B_2O_3, about 0,5 - about 6 wt-% P_2O_5, wherein Na_2O in combination with K_2O is present in an amount between about 16 - about 35 wt-%; K_2O in combination with MgO is present in an amount between about 5 - about 20 wt-% and MgO in combination with CaO is present in an amount between about 10 - about 25 wt-%.

14. The scaffold of claim 1 or 6, wherein the glass fibers comprise bioactive glass having a composition of about 53 wt-% SiO_2, about 6 wt-% Na_2O, about 12 wt-% K_2O, about 5 wt-% MgO, about 20 wt-% CaO, about 0 wt-% B_2O_3 and about 4 wt-% P_2O_5.

15. The scaffold of claim 1 or 6, wherein the fibers prior to sintering have a length from about 2 mm to about 30 mm.

16. The scaffold of claim 1 or 6, wherein the fibers prior to sintering have a length from about 5 mm to about 15 mm.

17. The scaffold of claim 1 or 6, wherein the glass fibers are sintered for about 1 minute to about 120 minutes.

18. The scaffold of claim 1 or 6, wherein the glass fibers are sintered for about 5 minutes to about 30 minutes.

19. The scaffold of claim 1 or 6, wherein the fibers prior to sintering have a diameter of about 0.010 mm - 1.0 mm.

20. The scaffold of claim 1 or 6, wherein the fibers prior to sintering have a diameter of about 0.030 mm - 0.300 mm.

21. The scaffold of claim 1 or 6, wherein the porosity of the scaffold is between about 5 to about 95 vol-%.

22. The scaffold of claim 1 or 6, wherein the porosity of the scaffold is between about 50 to about 90 vol-%.

23. The scaffold of claim 1, wherein the scaffold is a carrier for bioactive agents.

24. The scaffold of claim 6, wherein the scaffold is a carrier for bioactive agents.

25. The scaffold of claim 23, wherein the bioactive agent is selected from the group consisting of anti-inflammatory agents, antibacterial agents, antiparasitic agents, antifungal agents, antiviral agents, anti-neoplastic agents, analgesic agents, anaesthetics, vaccines, central nervous system agents, growth factors, hormones, antihistamines, osteoinductive agents, cardiovascular agents, anti-ulcer agents, bronchodilators, vasodilators, birth control agents, fertility enhancing agents and polypeptides.

26. The scaffold of claim 24, wherein the bioactive agent is selected from the group consisting of anti-inflammatory agents, antibacterial agents, antiparasitic agents, antifungal agents, antiviral agents, anti-neoplastic agents, analgesic agents, anaesthetics, vaccines, central nervous system agents, growth factors, hormones, antihistamines, osteoinductive agents, cardiovascular agents, anti-ulcer agents, bronchodilators, vasodilators, birth control agents, fertility enhancing agents and polypeptides.

27. The scaffold of claim 23, wherein the bioactive agent is bone morphogenetic protein.

28. The scaffold of claim 24, wherein the bioactive agent is bone morphogenetic protein.

29. The scaffold of claim 1 or 6, wherein the compressive strength of the scaffold is from about 5 MPa to about 25 MPa.

30. The scaffold of claim 1 or 6 wherein the compressive strength of the scaffold is over 20 MPa.

31. The scaffold of claim 1, wherein the scaffold is attached to a biocompatible polymeric film.

32. The scaffold of claim 6, wherein the scaffold is attached to a biocompatible polymeric film.

33. The scaffold according to claim 31 or 32, wherein the biocompatible polymeric film comprises a polymer or polymers selected from the group consisting of polyglycolide, polylactide, poly-β-hydroxybutyric acid, polydioxanone, polyvinylalcohol, polyesteramine, their copolymers and polymer blends thereof.

34 The scaffold of claim 1 or 6 capable of promoting bone regeneration.

35. The scaffold of claim 1 or 6, wherein the fibers are sintered together under compressive load.

36. The scaffold of claim 1 or 6, wherein the fibers are sintered together in a mold form.

37. The scaffold of claim 1 or 6, wherein the fibers form a mat which is attached to a membrane.

38. A method for making a scaffold comprising

contacting glass or ceramic fibers together,

sintering the glass or ceramic fibers in a manner to produce a porous scaffold.

39. The method of claim 38, wherein the glass fibers comprise bioactive glass fibers.

40. The method of claim 38, wherein the glass fibers are sintered together at a temperature from about 300°C to about 1500 °C.

41. The method of claim 38, wherein the glass fibers are sintered together at a temperature from about 600°C to about 700 °C.

42. The method of claim 38, wherein the glass fibers are sintered together at a temperature from about 630°C to about 680 °C.

43. The method of claim 38 wherein the glass fibers have a coating of one or more biocompatible polymers or copolymers.

44. The method of claim 43, wherein the glass fibers having a coating are sintered at a temperature of about 50°C to about 300 °C.

45. The method of claim 43, wherein the glass fibers having a coating are sintered at a temperature of about 100°C to about 200 °C.

46. The method of claim 38 or 43, wherein the glass fibers are sintered together for about 1 to about 120 minutes.

47. The method of claim 38 or 43, wherein the glass fibers are sintered together for about 5 to about 30 minutes.

48. The method of claim 38 or 43, wherein the glass fibers are sintered together under compressive load.

49. A method of promoting growth of bone comprising

contacting bone with a porous scaffold formed by sintering together glass fibers and

allowing the bone to grow into the porous scaffold.